

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders,

wherein the differentiating alone permits classification between obstructive and central breathing disorders.

2. (Previously Presented) A method as set forth in claim 1, further comprising detecting inspiration time and expiration time for successive breaths.

3. (Previously Presented) A method as set forth in claim 1, further comprising detecting a ratio of inspiration time and expiration time.

4. (Previously Presented) A method as set forth in claim 3, further comprising generating an evaluation signal which gives information as to whether imminent or already existing breathing disorders are obstructively and/or centrally caused based on the change with respect to time of said ratios.

5. (Previously Presented) A method as set forth in claim 3, wherein the evaluation results which give information as to whether a breathing disorder phase is imminent are generated from comparative evaluation of successively occurring changes in properties of the derivatives.

6. (Previously Presented) A method as set forth in claim 2, further comprising describing breathing disorders using a ratio of inspiration time  $I_x$  to expiration time  $E_x$ .

7. (Previously Presented) A method as set forth in claim 2, wherein a change in the duration of the inspiration time with respect to the expiration time is indicative of an imminent obstruction in the upper respiratory tracts.

8. (Previously Presented) A method as set forth in claim 2, further comprising extracting the evaluation results for an existing or imminent disturbance phase from comparative consideration of successively occurring changes in properties of derivatives of, or within, respiratory cycles.

9. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders:

detecting inspiration time and expiration time for successive breaths: and extracting the evaluation results for an existing or imminent disturbance phase from comparative consideration of successively occurring changes in properties of derivatives of, or within, respiratory cycles,

~~A method as set forth in claim 8, wherein consideration of the derivatives is directed to the beginning of the inspiration cycle and/or to the end of the inspiration cycle.~~

10. (Previously Presented) A method as set forth in claim 2, wherein consideration is directed to the curve shape during the inspiration cycle.

11. (Previously Presented) A method as set forth in claim 10, further comprising calculating an average gradient in simple form for intervals which extend over a predetermined percentage of the time duration of the respective breathing phase.

12. (Previously Presented) A method as set forth in claim 10, further comprising variably calculating a gradient at the phase change within a window over the inspiration cycle.

13. (Previously Presented) A method as set forth in claim 1, further comprising performing trend analysis based on the nature and constitution of breathing drive.

14. (Previously Presented) A method as set forth in claim 13, further comprising performing the trend analysis based on one or more of the following signal evaluation results: max. peak flow during the inspiration cycle, the breath volume, the inspiration time, and the second derivative of the measured flow curve.

15. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:  
differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders,

~~A method as set forth in claim 1, wherein the signal-processing consideration is carried out based on consideration of a derivative taken at the beginning of the expiration cycle or at the end of the expiration cycle respectively.~~

16. (Previously Presented) A method as set forth in claim 15, further comprising calculating the derivative either (a) in a simple form over a predetermined interval at the beginning of the expiration cycle and after the expiratory maximum flow, or (b) variably over the expiration cycle.

17. (Previously Presented) A method as set forth in claim 1, further comprising performing an evaluation procedure that includes consideration of the maximum peak flow

during the expiration cycle, the breath volume and/or the expiration time and/or the second derivative or curvature of the measured flow curve during the expiration cycle.

18. (Previously Presented) A method as set forth in claim 17, further comprising generating, based on the evaluation procedure, an evaluation result which furnishes information about the nature and the constitution of the upper respiratory tracts.

19. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders; and

~~A method as set forth in claim 1, further comprising~~ analyzing the number of local maxima and minima, the amplitude of the local maxima and minima, the sequence of the magnitude of the amplitudes of local maxima and minima, and the frequency in the sequence of local maxima and minima in considering the configuration of the curve shape.

20. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders; and

~~A method as set forth in claim 1, further comprising~~ performing spectral consideration and consideration in respect of amplitude of a snoring signal.

21. (Previously Presented) A method as set forth in claim 1, further comprising performing trend analysis of the evaluation results including combined consideration of at least two parameters.

22. (Previously Presented) A method as set forth in claim 21, wherein the trend analysis is based on consideration of the variation in the ratios between two of the following parameters: inspiration time, expiration time, breath duration, breath frequency, breath volume during the inspiration cycle, breath volume during the expiration cycle, first differential and second differential of the respiratory flow, amplitudes of local maxima and local minima, frequency of local maxima and local minima, inflexion points, maximum inspiratory flow, and maximum expiratory flow.

23. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders; and

~~A method as set forth in claim 1, further comprising~~ generating evaluation results based on an evaluation procedure which give information about at least one of the following:

- the nature of the upper respiratory tracts, at least for differentiating between central and obstructive apneas,
- the elastic properties of the upper respiratory tracts,
- the location of an obstruction,
- the degree of severity of a sleep apnea, and
- the  $P_{crit}$ -value.

24. (Previously Presented) An apparatus for carrying out the method as set forth in claim 1.

25. (Currently Amended) An apparatus for supplying a respiratory gas to a patient at a pressure level which is above the ambient pressure at least in phase-wise manner, comprising a delivery device for delivering the respiratory gas, a measuring device for generating a signal indicative of the respiratory gas flow, a regulating device for regulating the respiratory gas pressure to a predetermined reference pressure, a pressure presetting device for presetting the reference pressure, and

a signal processing device configured to generate, based on a variation in respiratory cycle-specific reference features obtained via differentiation, an evaluation result which is indicative of whether or to what extent a prevailing or imminent breathing disorder is of obstructive or central origin,

wherein the reference pressure is determined having regard to said evaluation result, and  
wherein the evaluation result indicative of whether or to what extent a prevailing or imminent breathing disorder is of obstructive or central origin is based solely on a variation in respiratory cycle-specific reference features obtained via differentiation.

26. (Previously Presented) The apparatus as set forth in claim 25, further comprising a respiratory gas line extending between the delivery device and a breathing mask.

27. (Currently Amended) An evaluation apparatus for evaluation of a series of measurement data which contains items of information indicative in respect of the pattern in respect of time of the breathing of a patient, comprising:

a signal processing device configured to generate, based on a variation in respiratory cycle-specific reference features obtained via differentiation, evaluation results indicative of whether or to what extent the measurement series contains sequences which are to be classified as a breathing disorder of obstructive or central origin,

wherein the signal processing device is configured to generate the evaluation result based on the variation in respiratory cycle-specific reference features obtained directly via differentiation.

28. (Previously Presented) An evaluation apparatus as set forth in claim 27, further comprising a display configured to visualize the measurement series at least in portion-wise manner and to distinguish sequences of presumed disturbed breathing as sequences of obstructive or central origin.

29. (Previously Presented) A method as set forth in claim 5, wherein the derivative is the first derivative of the respiratory gas flow in the region of the breathing phase change.

30. (Previously Presented) A method as set forth in claim 8, wherein the derivative is the first derivative of the respiratory gas flow in the region of the breathing phase change.

31. (Previously Presented) A method as set forth in claim 11, wherein the predetermined percentage is 10%.

32. (Previously Presented) A method as set forth in claim 16, wherein the predetermined interval is 10%.

33. (Previously Presented) A method as set forth in claim 23, wherein the elastic properties of the upper respiratory tracts include restoring modulus and/or modulus of elasticity.

34. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure

regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

generating evaluation results of the measurement signal, on a PAP device, indicative of the respiratory gas flow, the evaluation results permitting classification between obstructive and central breathing disorders; and

analyzing, on the PAP device, the number of local maxima and minima, the amplitude of the local maxima and minima, the sequence of the magnitude of the amplitudes of local maxima and minima, and the frequency in the sequence of local maxima and minima in considering the configuration of the curve shape.

35. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

generating evaluation results of the measurement signal, on a PAP device, indicative of the respiratory gas flow, the evaluation results permitting classification between obstructive and central breathing disorders,

wherein the signal processing further includes spectral consideration and consideration in respect of amplitude of a snoring signal.

36. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure

regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

generating evaluation results of the measurement signal, on a PAP device, indicative of the respiratory gas flow, the evaluation results permitting classification between obstructive and central breathing disorders,

wherein said evaluation results are generated based on an evaluation procedure which gives information about at least one of the following: the nature of the upper respiratory tracts, at least for differentiating between central and obstructive apneas, the elastic properties of the upper respiratory tracts (including restoring modulus and/or modulus of elasticity), the location of an obstruction, the degree of severity of a sleep apnea, and the  $P_{crit}$ -value.

37. (Currently Amended) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

generating evaluation results of the measurement signal on a PAP device, the evaluation results permitting classification between obstructive and central breathing disorders and being indicative of the respiratory gas flow via differentiation,

wherein the signal-processing consideration is carried out (1) based on consideration of a derivative taken at the beginning of the inspiration cycle or at the end of the inspiration cycle, and/or (2) based on consideration of a derivative taken at the beginning of the expiration cycle or at the end of the expiration cycle.

38-40. (Cancelled).

41. (New) A method of carrying out signal-processing consideration of a measurement signal related to the respiration activity of a person when matching pressure regulation in administering a breathable gas at a pressure level which at least in phase-wise manner is above ambient pressure, the method comprising:

differentiating the measurement signal to generate, on a PAP device, evaluation results indicative of the respiratory gas flow, the differentiating permitting classification between obstructive and central breathing disorders,

wherein classification between obstructive and central breathing disorders is based on variables and/or mathematical operations consisting essentially of the differentiating.